

REMARKS/ARGUMENTS

Summary of Interview

Applicants wish to thank Examiner Flory for extending the courtesy of an interview on May 9, 2007. During the interview, the inventor, Dr. William R. McGrath, discussed the prior art and, in particular, Lin, J., "Noninvasive Microwave Measurement of Respiration", Proceedings of the IEEE, October 1975, p. 1530 and Chen et al., "An X-Band Microwave Life-Detection System", IEEE Transactions on Biomedical Engineering, Vol. BME 33, No. 7, July, 1986, pp. 697 - 701. Dr. McGrath explained that the prior art of record describes obtaining information from reflected microwave signals associated with the mechanical motion of the subject's body. Dr. McGrath contrasted the prior art to the systems described in the present application, which extract information from reflected microwave signals that is associated with the electrochemistry of the subject's heart. The claims were discussed; however, no agreement was reached with respect to the patentability of the claims.

Summary of the Office action

The Office action issued February 9, 2007 included the following rejections:

- claims 1, 2, 4, 6, 7, 9, 11, 12 and 15 were rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent 6,122,537 to Schmidt (the Schmidt patent);
- claims 1, 2, 4, 6, 7, 9, 11, 12 and 15 were also rejected under 35 U.S.C. § 103(a) as being obvious in light of the combination of U.S. patent 6,208,286 to Rostislavovich et al. (the Rostislavovich et al. patent) and U.S. Patent 4,958,638 to Sharp et al. (the Sharp et al. patent); and
- claims 16 - 18 were rejected under 35 U.S.C. § 103(a) as being unpatentable in light of the Schmidt patent, or the combination of the Schmidt patent and the Rostislavovich et al. patent, or the combination of the Schmidt patent and the Sharp et al. patent.

Rejection of claim 1

Claims 1, 2, 4, 6, 7, 9, 11, 12 and 15 were rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent 6,122,537 to Schmidt (the Schmidt patent) and under 35 U.S.C. § 103(a) as being obvious in light of the combination of the Rostislavovich et al. patent and the Sharp et al. patent. Applicants respectfully submit that the prior art of record does not explicitly teach that the “reflections of the electromagnetic signal beam” include “amplitude variations indicative of time dependent variations in the complex impedance of the illuminated tissue associated with electrical activity of the subject’s heart”. Consequently, the prior art of record does not teach “a detector ... configured to extract from the reflected signal beam the variations in amplitude indicative of time dependent variations in the complex impedance of the illuminated tissue associated with the electrical activity of the subject’s heart.”

In addition, Applicants respectfully submit that none of the prior art of record describes the combination in claim 1 of:

1. A remote-detection system for monitoring changes in complex impedance associated with physiological activity of a subject that is free to move, comprising:

a source containing an oscillator configured to illuminate tissue of the subject with an electromagnetic signal beam;

a receiver configured to receive reflections of the electromagnetic signal beam from the subject, where the reflections include amplitude variations indicative of motion of the subject and amplitude variations indicative of time dependent variations in the complex impedance of the illuminated tissue associated with electrical activity of the subject’s heart; and

a detector connected to the receiver and configured to extract from the reflected signal beam the variations in amplitude indicative of time dependent variations in the complex impedance of the illuminated tissue associated with the electrical activity of the subject’s heart.

Rejection of claims 2, 4, 6, and 15

Claims 2, 4, 6 and 15 depend from claim 1. Therefore, Applicants submit claims 2, 4, 6 and 15 are allowable for reasons including that claims 2, 4, 6 and 15 depend from an allowable base claim.

Rejection of claim 7

Similar rejections to those made above with respect to claim 1 were made with respect to claim 7. For reasons similar to those outlined above with respect to claim 1, Applicants respect that claim 7 is allowable over the prior art of record. In particular, none of the prior art of record teaches the following combination from claim 7:

7. A remote-detection system for monitoring the physiological activity of a subject, comprising:
- means for illuminating at tissue of the subject with an electromagnetic signal;
 - means for detecting reflections of the electromagnetic signal, where the reflections include amplitude variations indicative of motion of the subject and amplitude variations indicative of time dependent variations in the complex impedance of the illuminated tissue with respect to the electrical activity of the subject's heart; and
 - means for extracting a signal indicative of the changes in the amplitude of the electromagnetic signal reflected by the subject that are associated with time dependent changes in the complex impedance of the illuminated tissue with respect to the electrical activity of the subject's heart.

Rejection of claim 9

Similar rejections to those made above with respect to claim 1 were made with respect to claim 9. For reasons similar to those outlined above with respect to claim 1, Applicants respect that claim 9 is allowable over the prior art of record. In particular, none of the prior art of record teaches the following combination from claim 9:

9. A method of observing changes in the complex impedance of a subject associated with physiological activity, comprising:
- illuminating tissue of the subject with an electromagnetic signal beam;
 - receiving reflections of the electromagnetic signal beam that include amplitude variations indicative of motion of the subject and amplitude variations indicative of time dependent variations in the complex impedance of the illuminated tissue associated with electrical activity of the subject's heart; and
 - extracting from the reflected signal a signal indicative of the changes in the amplitude of the electromagnetic signal associated with time dependent changes in the complex impedance of the illuminated tissue associated with the electrical activity of the subject's heart.

Rejection of claims 11, 12, and 18

Claims 11, 12, and 18 depend from claim 9. Therefore, Applicants submit claims 11, 12, and 18 are allowable for reasons including that claims 11, 12, and 18 depend from an allowable base claim.

Conclusion

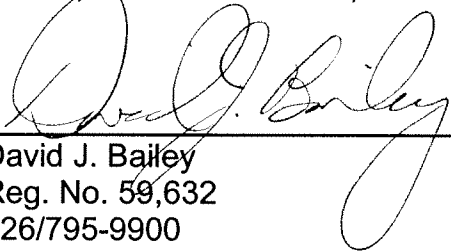
In view of the foregoing amendment and response, it is believed that the application is in condition for allowance and, accordingly, reconsideration and allowance is earnestly solicited.

If any questions remain regarding the allowability of the application, Applicant would appreciate if the Examiner would advise the undersigned by telephone.

The Commissioner is hereby authorized to charge any fees under 37 CFR 1.16 and 1.17 which may be required by this paper to Deposit Account No. 03-1728. Please show our docket number with any charge or credit to our Deposit Account.

Respectfully submitted,

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